DOCUMENT RESUME

ED 119 079 CG 010 388

AUTHOR Barnowe, J. Thad; And Others
TITLE An Empirically Derived Model of Job Satisfaction.
PUB DATE [71]
NOTE 73p.

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage
DESCRIPTORS *Job Analysis; *Job Satisfaction; *Models; Need Gratification; Research Projects; Surveys; *Work Environment

ABSTRACT

This paper reviews the various experimental and survey strategies employed to assess the relative importance of different job characteristics in determining job satisfaction, and analyzes the problems involved with the different approaches. The paper then describes the development of an empirically derived explanatory model of job satisfaction, taking into account problems of multi-co-linearity and interaction among the predictor variables. The importance of any job facet was equated with its capacity to account for variance in job worker satisfaction scores. The job facets were subsumable into four basic dimensions: (1) opportunities it provided to perform challenging or self-developing activities; (2) the resources enabling adequate performance; (3) provision of a comfortable work environment; and (4) provision of financial rewards and job security. The model was able to explain some 53% of the variance in job satisfaction scores, and the authors note some of the problems that make such explanatory power acceptable. Of the four dimensions, "challenge" seemed most promising. Further directions for research and refinement are indicated. (NG)

AN EMPIRICALLY DERIVED MODEL OF JOB SATISFACTION

J. THAD BARNOWE, THOMAS W. MANGIONE AND ROBERT P. QUINN

Survey Research Center, The University of Michigan

The question of which facets of American workers jobs are most important to them may be answered through the application of at least four distinctly different research strategies. The first and most naïve of these strategies is based exclusively upon data obtained from interviews held with or questionnaires administered to workers. The worker is typically presented with a list of job facets (e.g., pay, supervision, the information he has to do his job, his physical working conditions, etc.) and asked to rate or rank them in terms of how important each is in what he regards for himself as a "good job," an "ideal job," or the type of job that he would "most like to have." Studies employing this strategy date as far back as 1932 (Chant, 1932) and have been appearing ever since (e.g., Hersey, 1936; Wyatt, Langdon, & Stock, 1937; Raube, 1947; Jergensen, 1948; Evans & Leseau, 1950. Many studies that had used this strategy prior to 1957 have been summarized by Herzberg et al. (1957).

An earlier report that used data from the present study's sample in order to estimate which job facets were most important to American workers employed this first strategy. A national probability sample of American workers were asked to rate 25 facets of their jobs in terms of their importance. A factor analysis of these importance ratings (Cobb & Quinn, 1971) indicated that the 25 facets could be represented by five

orthogonal factors: Challenge, Resources, Comfort, Financial Rewards, and Relations with Co-workers. None of these five appeared to be overwhelmingly most important to workers. If, however, any one such general aspect of the job were to be singled out as the most important, Quinn (1971) suggests that it would be the adequacy of the resources the worker received to help him do his work well. The data further indicated that the Challenge aspects of workers' jobs were more important to them than their jobs' Comfort aspects. It appeared somewhat more important to workers to have interesting, stimulating, and self-enriching jobs than untroublesome, undemanding, and "soft" ones.

The second strategy that may be used to identify the relative importance of job facets is simultaneously the most logically sound, the most persuasive, and the most expensive. This strategy, based on the Lewinian postulate of that which is real is that which has real effects, is an experimental one involving the manipulation of the quality of employment of a sample of workers with respect to some facets of their jobs. The success of the experimental manipulation is assessed in terms of its capacity to effect a desired change in workers' attitudes or behaviors (e.g., job satisfaction, productivity, absenteeism, turnover, etc.). The importance of a job facet is hence identified operationally by the magnitude of the effect upon the desired outcome by the experimental manipulation of quality of employment with respect to the job facet. Morse and Reimer (1956), for example, assert that the amount of autonomy and/or control afforded to workers in their jobs is important to them because experimentally induced increases of workers' autonomy and control resulted in increased job satisfaction and improvements in other criteria of morale.

Although the few existing studies employing this experimental strategy for inferring the importance of job facets may have demonstrated particular facets to be of at least some importance, they have provided no indication of the relative importance of different job facets. To do so would require the manipulation in identical settings of each of the many facets the relative importance of which is to be assessed. Such extensive manipulations would exceed the resources of most investigations and would most likely exceed the limits of cooperation of any employer.

The two remaining strategies, while not themselves experimental, nevertheless share with the experimental strategy the assumption that the importance of a job facet may be identified by its effects. Each of these experimental substitutes, like the true experimental strategy, identifies some criterion or outcome. Most commonly this criterion is job satisfaction; less frequently it is some aspect of workers' behaviors. An attempt is then made to explain variance in the criterion in terms of correlations between criterion scores and measures of quality of employment with regard to different job facets. The importance of any facet is defined by the magnitude of the correlation between the criterion measure and a measure of the quality of employment with reference to that facet.

The third general strategy for identifying importance, based on the principle just described, involves asking workers to identify the major sources of their job satisfaction or dissatisfaction. The facets most frequently cited by workers in response to such a question are assumed to be those facets that are most important to them. This

strategy, exemplified in the work of Herzberg, Mausner, and Snyderman (1959), very economically avoids the nuisance of having to establish directly any relationship between the job satisfaction criterion and the quality of employment predictors. Instead, workers are asked, in effect, to "vote" their affirmations of hypotheses relating various job facets to job satisfaction. Had Freud used such a strategy to determine the sources of hysteria, he would not have bothered to talk to Dora but would instead have based his theory of hysteria upon interviews with a sample of Viennese hysterics whom he asked what they thought had caused their symptoms. As a substitute for an experimental strategy, this strategy is a poor one indeed.

The fourth strategy for determining what is important to workers depends, like the previous two, upon identifying a relationship between a criterion measure and the quality of employment with respect to an assortment of job facets. This strategy, like the "voting" one is an experimental substitute that does not involve the manipulation of quality of employment variables. It relies instead upon cross-sectional measures of some criterion and a set of quality of employment predictors. The importance of any job facet is defined in terms of the contribution it makes to criterion variance. Because it establishes directly the associations between quality of employment predictors and the criterion, it is superior to the third strategy wherein workers only vote upon such associations. It shares with the voting strategy a reliance upon cross-sectional data and is consequently limited in its capacity to establish the direction of causality between what are presumed to be its criterion and predictor measures. It is therefore clearly inferior to the

experimental strategy. It is also probably superior to the strategy based directly upon workers' importance ratings or rankings of job facets because of its avoidance of some of the latter's less tenable phenomenological assumptions.

This report attempts to answer the question of what facets of work are most important to American workers through an application of this fourth strategy. Although the relative importance of many job facets was investigated, only one criterion was used: job satisfaction. The importance of any job facet was defined operationally in terms of the contribution to workers' general levels of job satisfaction by the quality of employment that workers' experienced with regard to that facet. There is certainly no lack of investigations indicating that particular facets of workers' jobs are related to their levels of job satisfaction. Job satisfaction, has, for example, been shown to be related to: quality of supervision (Jackson, 1953; Kahn and Katz, 1960; Purcell, 1960), workgroup interaction (Walker and Guest, 1952), job content (Herzberg, Mausner, Peterson and Capwell, 1957; Schwartz, Jenusaites and Stark, 1963; Walker and Guest, 1952), work-pace (Marriott and Denerley, 1955; Walker and Guest, 1952; Walker and Marriott, 1951), wages (Lawler and Porter, 1963; Smith and Kendall, 1963; Whyte, 1955), promotional opportunities (Morse, 1953; Sirota, 1959), and hours of work (Marriott and Denerley, 1955).

That each of these job facets has been shown to be an appreciable determinant of (or at least a correlate of) job satisfaction says nothing about the relative importance of these facets. It is of course possible in principle to compare Study A's reported correlation between

job facet A and job satisfaction with the correlation reported in Study B between job satisfaction and job facet B. Unfortunately, this comparison demands that the studies have used equivalent samples, job satisfaction measures, and statistical estimates of associations between job satisfaction and the job facets investigated.

Previous studies that have attempted to relate quality of employment to job satisfaction have for the most part differed so markedly in terms of their samples, job satisfaction measures, and their manner of reporting statistical relationships that it is futile to try to piece together from them any estimate of the relative importance of job facets in terms of their relative contributions to workers' job satisfaction. Even if these studies had been comparable in these respects, a posteriori estimates of relative importance based on their data would have been unable to surmount the problem of the multicolinearity of the quality of employment measures used to predict job satisfaction scores. Although a bivariate study designed to estimate the association between a quality of employment indicator and job satisfaction can successfully identify the first-order relationship between that predictor and the criterion, no accounting can be made of the effects of the predictor upon the criterion independent of the collateral effects of other predictors unmeasured in the study. Study A may, for example, show that wages are associated with job satisfaction, and Study B may show that having an "interesting" job is related to job satisfaction. But having an interesting job may itself be correlated with high wages. The issue therefore remains as to whether high wages by themselves, independent of having an interesting job, significantly affect job satisfaction or whether having

an interesting job affects job satisfaction when the effects of wages are held constant. Such problems of multicolinearity cannot be answered by any set of bivariate studies that concentrate on the relationships between job satisfaction and job facets where the latter are only considered one at a time. What is clearly required in order to assess the independent effects of quality of employment with regard to various job facets is a multi-variate study of job satisfaction capable of assessing the effects of each job facet with the effects of all other facets held constant. Since bivariate studies cannot provide this information, it is impossible to determine what is most important to workers by summarizing the results of such studies.

Another major handicap in attempting to infer the relative importance of job facets from a compilation of bivariate relationships reported in different studies is the inability of such a compilation to take into account interactions among job facets. It may be, for example, that having an interesting job is an important determinant of job satisfaction among well-paid workers but a less important one among low-income workers. What is important to one group of workers may be considerably less important to another. Any attempt to determine the relative importance of job facets through determining the associations between job satisfaction and quality of employment with regard to these facets should certainly be able to accommodate interactions among these job facets.

This paper describes the development of an empirically-derived explanatory model of job satisfaction that took into account both the problem of multicolinearity and that of interactions among predictors.

As was indicated above, the criterion variable to be explained by the model was job satisfaction, and the predictors were indicators of workers' quality of employment with regard to a large set of job facets. The importance of any job facet was equated with its capacity to account for variance of workers' job satisfaction scores.

Three major questions concerning this model guided the analyses described below:

1. How well was workers' job satisfaction explained by the model? Although the principal concern of this investigation was to determine the relative importance of many quality of employment predictors in explaining the criterion of workers' levels of job satisfaction, a prior issue was the adequacy of the "fit" between the quality of employment model and the job satisfaction criterion. If the quality of employment predictors could not explain much criterion variance, there would have been little sense in identifying the model's most effective predictors. It would have amounted to identifying only the best of a bad lot.

2. Which job facets were the model's best predictors of job satisfaction? In short, and most centrally, which facets of workers' jobs were most important to them?

3. How general was the model? The model was derived from data obtained from a national probability sample of American workers. While it might have therefore been generally applicable to American workers as a whole, it might have been considerably less applicable to more homogeneous subsamples of workers. For this reason replications of all major aspects of the model were attempted with data obtained from more selected demographically-defined subsamples.

METHOD

Sample

The analysis sample was selected from the Working Conditions Survey's national probability sample of 1533 employed persons who were living in households, were 16 years old or older, and were working for pay 20 hours a week or more. Many predictor measures employed in the analysis were inapplicable to self-employed workers and these workers had not therefore been asked questions upon which these measures were based. Consequently, the analysis was confined to the sample's 1327 wage-and-salaried workers.

Measures

Criterion.--The principal criterion measure was Jobsat '72, an estimate of workers' overall job satisfaction. Jobsat '72 had two distinct components, each embodying a different approach to measuring job satisfaction. The first component, Jobsat '70, was a mean of 23 evaluative statements about specific facets of the job (e.g., "the pay is good") that were rated by each worker on a four-point scale indicating how true each was of his job. The second component, Facet-free Job Satisfaction, was based on five very general questions about job satisfaction that did not refer to any specific job facets. The five questions were: "All in all, how satisfied would you say you are with your job?" "If a good friend of yours told you (he/she) was interested in working in a job like yours for your employer, what would you tell (him/her)?" "Knowing what you know now, if you had to decide all over again whether to take the job you now have, what would you decide?"

"In general how well would you say that your job measures up to the sort of job you wanted when you took it?" "I'd like to get some idea of the kind of job you'd most like to have. If you were free to go into any type of job you wanted, what would your choice be?" The first four questions were scored in terms of fixed-alternative response categories and the last one in terms of whether or not the worker mentioned his present job as the one he would most like to have. Jobsat '72 was created by transforming the distributions of these two component indices into z scores, taking a mean of the two, and adding a constant to remove negative signs.

Predictors.--The predictors were chosen from among 44 questions or combinations of questions referred to as "Quality of Employment" indicators in other reports in this series.* These 44 predictors were grouped so as to be consistent with dimensions determined for job satisfaction and importance of job facets. At the beginning of each worker's interview he was asked to rate 23 job facets in terms of how important each was to him in a job. At the end of the interview he rated the same job facets so as to indicate his satisfaction with each. The latter ratings provided the raw material for the Jobsat '70 measure of overall job satisfaction. A factor analysis of the importance ratings indicated that the 23 items could be represented by five orthogonal factors of

*The same indicators have at times also been referred to as either "Quality of Work" or "Quality of Job" indicators. The latter labels were found, however, to lead to some confusion among casual readers who mistakenly assumed that the "quality" referred to the worker's performance on the job rather than to characteristics of his working conditions. As a result, the term "Quality of Employment" has been substituted.

Comfort, Challenge, Financial Rewards, Relations with Co-workers, and Resources (Quinn et al., 1971, pp. 37-41). For each worker in the sample five summary importance scores were computed over all the importance ratings that had substantial loadings on each of the five factors. Based on the same factorially determined groupings of items, five satisfaction scores were also computed that reflected the degree to which the worker was satisfied with his working conditions in each of the five areas. While this indexing provided a meaningful way of organizing the otherwise miscellaneous importance and satisfaction ratings, the same principle of organization was not until recently applied to the more strictly descriptive questions which constituted the bulk of the interview.

A set of 44 Quality of Employment indicators was defined in response to this need to organize the interviews' more descriptive questions into indices that would be parallel to the importance and satisfaction indices. Each of the descriptive questions in the interview was therefore examined in terms of whether it appeared relevant to one of the basic five dimensions of Comfort, Challenge, Financial Rewards, Relations with Co-workers, and Resources. Forty-four questions or combinations of questions were thus identified. These 44 variables differed considerably in terms of their response formats. Some were open-ended, some used fixed alternatives, and some were based on continuous scales, such as numbers of dollars or hours. Through a series of highly arbitrary decisions the responses to each question were converted to five-point scales where the greatest code value represented what was judged a priori to be a response configuration indicating the "best" type of

working conditions. These 44 variables, listed in Table 1, constituted the initial set of predictors in the analysis reported below.

Procedure

There are three basic requirements that any explanatory model should meet. One requirement is a convenient means of representation, such as that given by a linear prediction equation of the form $Y = f(A,B,C \ldots) + e$, where Y represents scores on the criterion as a function of predictor variables A, B, C ... plus error (e). A second requirement is that the predictability of each individual's criterion score is maximized using predictors selected with a minimum chance of including predictors that would prove ineffective for a replication sample of respondents. A third requirement is the minimization of the chance of failing to include as predictors those variables that do work consistently well in explaining criterion variance.

One strategy for constructing empirically derived models meeting these requirements has been suggested by Sonquist (1969, 1970). This ~~this~~ strategy, involving the use of two complementary statistical procedures for identifying useful predictors and examining their individual and collective relationships to a criterion, appeared ideally suited for building a Quality of Employment model that would explain the criterion variable of job satisfaction.

The statistical technique used in the final generation of the job satisfaction model was the Multiple Classification Analysis (MCA) developed by Andrews, Morgan, and Sonquist (1967). MCA assumes that a criterion score consists of the sum of a series of main effects. These

TABLE 1

REASONS FOR INCLUDING OR EXCLUDING PREDICTORS GROUPED BY FACTOR

Quality of Employment Predictors[a]	Disposition of Predictor[b]
Worker's supervisor encouraged new ways of working	Included: Sufficient Power
Worker's job required high level of skill	Included: Theory
Worker's job allowed freedom as to how to do his work	Included: Sufficient Power
Worker's job did not prevent him from using skills he would like to be using	Included: Sufficient Power
Worker's supervisor let his subordinates alone unless they asked for help	Included: Sufficient Power
Worker's job required learning new things	Included: Sufficient Power
Worker's job required that he be creative	Included: Sufficient Power
Worker's job involved doing a variety of things	Included: Sufficient Power
Worker had exactly the education his job required (instead of more education than the job required; workers with less education than the job required were not included in this measure)	Included: Sufficient Power
Worker's job allowed him to make a lot of decisions on his own	Included: Sufficient Power
Worker had enough authority to tell others what to do	Included: Sufficient Power
Worker's employer made available to him a training program for improving his skills	Included: Sufficient Power
Worker's job was not one in which he was required to do things which were very repetitious	Excluded: Redundant

TABLE 1--(continued)

Quality of Employment Predictors[a]	Disposition of Predictor[b]
Worker often got so wrapped up in his work that he lost track of time	Excluded: Insufficient Power
Worker's supervisor let those he supervised set their own work pace	Excluded: Redundant
Worker's job required that he do a lot of planning ahead	Excluded: Insufficient Power
<u>Resource Predictors</u>	
Worker's supervisor maintained high standards in his work	Included: Sufficient Power
Worker's supervisor knew his own job well	Included: Sufficient Power
Worker had enough help from others with whom he worked	Included: Sufficient Power
Worker had enough machinery and equipment to do his job well	Included: Sufficient Power
Worker had enough facts and information to do his job well	Included: Sufficient Power
<u>Comfort Predictors</u>	
Worker had no problems with his hours, his work schedule, or with working overtime (as opposed to having a problem of great severity)	Included: Sufficient Power
Worker did not experience dangerous or unhealthy conditions on his job (as opposed to having experienced at least one hazard of great severity)	Included: Sufficient Power
Worker had enough time to do what others expected of him	Included: Sufficient Power
The physical conditions of worker's job were pleasant and comfortable (as opposed to experiencing conditions he regarded as a severe problem)	Included: Theory

TABLE 1--(continued)

Quality of Employment Predictors[a]	Disposition of Predictor[b]
Worker had no problems with transportation to and from work (as opposed to having a problem of great severity)	Included: Theory
Worker's job did not require that he work very fast	Included: Sufficient Power
Worker mostly determined whether he would work overtime on his job (as opposed to a job in which his employer mostly determined whether he would work overtime and in which the worker could not refuse to work overtime without penalty)	Included: Sufficient Power
Worker did not work excessive hours (more than fifty hours per week)	Included: Theory
Worker's job did not require that he work very hard	Included: Sufficient Power
Worker's supervisor did not insist that those under him work hard	Included: Sufficient Power
Worker did not have to take much time to get to work	Included: Theory
Worker did not have to travel many miles to get to work	Excluded: Insufficient Power
Worker was a full time worker who arrived at work between seven and ten a.m. as opposed to arriving at any other times (part time workers and workers with varying schedules were not included in this measure)	Excluded: Insufficient Power
Worker worked the same days and hours each week (as opposed to working irregular days and/or hours	Excluded: Insufficient Power
Worker's job did not require that he exert a lot of physical effort.	Excluded: Insufficient Power

TABLE 1--(continued)

Quality of Employment Predictors[a]	Disposition of Predictor[b]
Financial Reward Predictors	
Worker's employer made many fringe benefits available to him	Included: Sufficient Power
Worker desired no additional fringe benefits (as opposed to desiring additional benefits the absence of which he regards as a severe problem)	Included: Sufficient Power
Worker was a full time worker who received a high income from his job (part time workers were not included in this measure)	Included: Theory
It was unlikely that worker's job would be automated (as opposed to having a job which was very likely to be automated and in such an event he would be out of a job)	Included: Sufficient Power
It would be easy for worker to find a new job as good as his present one (comparable in pay and fringe benefits)	Included: Sufficient Power
Worker had steady employment throughout the year (as opposed to having irregular employment which he regarded as a severe problem)	Excluded: Insufficient Power
When asked about problems with his hours, his work schedule, or overtime worker did not mention problems with irregular employment (as opposed to mentioning such a problem which he regarded as a severe problem)	Excluded: Insufficient Power

[a]Quality of employment statements are worded so as to describe the high scoring category. In measures where the low scoring category is not obvious, it is described in parenthetical statement.

[b]Included: Sufficient Power--variable was included because it explained at least .6% of the variance in the job satisfaction measure.
Excluded: Insufficient Power--variable did not explain at least .6% of the variance.
Included: Theory--variable was included for theoretical reasons.
Excluded: Redundant--variable was excluded because it was judged to be sufficiently redundant with other measures in the set.

main effects are coefficients associated with membership in a particular response category of each predictor. The model based on MCA can be represented by the equation $Y = \bar{Y} + a_i + b_j + c_k + \ldots + e_{ijk}$, where $\bar{Y}$ is the sample mean on the criterion and a_i is the coefficient computed by MCA indicating the effect (to be added or subtracted from the mean) of being in a particular response category of predictor A, b_j indicates the effect on a particular score of predictor B, etc. Since each response category of each predictor is treated discreetly, MCA may employ predictors that do not have interval scales and that as a result cannot be used in conventional multiple regression analysis. Other than their use of different algorithms and of predictors that differ considerably in their scaling assumptions, MCA and multiple regression have much in common. Both accommodate correlated predictors and show the effects of each predictor on the criterion while holding constant the effects of other predictors, thereby enabling the detection and elimination of predictors having spurious first-order correlations with the criterion. Both generate an R (the multiple correlation between the set of predictors and the criterion) and an R^2 (an estimate of the proportion of criterion variance explained by the main effects of all predictor variables operating simultaneously).

The adequacy of any model generated by MCA (and multiple regression as well) is, however, limited by its assumption that the effects of the predictor variables on the criterion are strictly additive. It assumes that there are no interactions among the predictors or, in other words, that the effects of predictor A on the criterion is the same for people having any scores on predictor B. This assumption of additivity

and lack of interaction effects is not, however, one that is always safe to make.

In order to compensate for this limitation the developers of MCA recommend its joint use with the Automatic Interaction Detector (AID) technique (Sonquist & Morgan, 1964; Morgan, Baker, & Sonquist, 1971). Capable of handling data with scales as primitive as nominal ones, AID is in some respects analogous to a step-wise analysis of variance. The computerized version of AID employs one continuous criterion measure and any number of predictors that may range in their scale properties from ratio to nominal. AID examines the associations between predictor and criterion variables in an attempt to determine the dichotomous split on any predictor which will yield the greatest difference in criterion score. Once AID has identified this initial dichotomy it examines each of the two groups thus defined in order to determine which other predictor will best dichotomize each group in terms of criterion scores. It may determine that the "second best" predictor is the same in both groups; in this case no interaction is present between the first two of the most important predictors. On the other hand, AID may disclose that the "second best" predictor in group 1 is a variable which is not also the "second best" predictor in group 2. In this case an interaction is suggested. Having dichotomized on the basis of "second best" predictors the two groups already dichotomized on the "best" predictors, AID attempts to dichotomize each of the resulting groups at still a third level--and a fourth, and a fifth, and so on until the maximum set of possible dichotomizations has been achieved or until the groups to be dichotomized are reduced in number to a point where further

dichotomization is statistically unreliable. This breakdown of the sample through such successive AID dichotomizations makes it possible to detect interaction effects by noting different relationships between predictors and the criterion that appear in groups of workers already dichotomized in earlier steps of the AID analysis.

The strategy for the joint use of AID and MCA recommended by Sonquist (1970) involves as a first step the use of AID to detect whether interactions are present in the data. If interactions are identified through AID, new predictor variables are constructed which incorporate both the main effects and the interactions of the interacting variables. These "interaction terms" are included into the roster of additive components that are used in the final MCA analysis, and the original predictors on which the interaction terms were based are excluded from the MCA analysis. If, on the other hand, no substantial interactions are identified, no interaction terms are constructed for the MCA analysis and the MCA may proceed under the assumption that the relationships in the data between the predictors and the criterion are strictly additive.

Streamlining the set of predictors

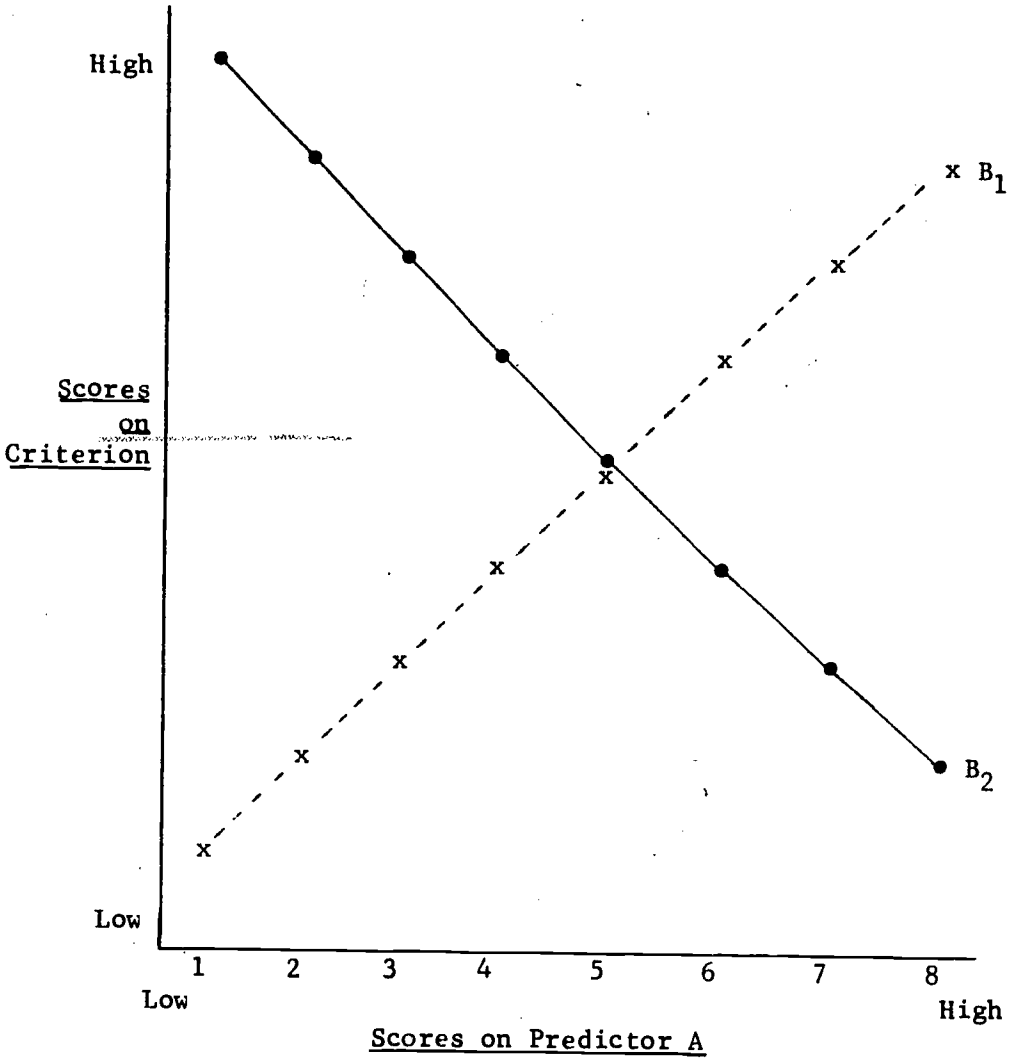
Since the largest available computerized version of MCA could accept only 33 predictors with as many as five response categories each, it was necessary to eliminate at the onset eleven of the 44 Quality of Employment predictors as candidates in the job satisfaction model. These 44 predictors were therefore subjected to a preliminary AID analysis in order to compete with each other in demonstrating their

effectiveness in explaining variance in the job satisfaction measure. AID indicated the power of each predictor in comparison to all others in both the total sample and in each subgroup isolated in the analysis. The decision to eliminate a variable hinged primarily on its empirically determined ability to explain criterion variance. Some exceptions to this were, however, made for theoretical reasons. For example, the variable assessing quality of employment with regard to annual income for the job appeared, according to AID, to be a low-power predictor but was nevertheless retained in the analysis because of its obvious centrality in the Financial Rewards cluster of variables. To provide room for the annual income predictor, one of three variables assessing quality of employment with regard to the amount of autonomy allowed by the worker's immediate superior was discarded, even though by itself it was a more powerful predictor than the income variable. The 11 variables that were thus eliminated and the reasons for their exclusion are indicated in Table 1, along with the 33 variables comprising the final set of predictors.

RESULTS

Evaluating interaction effects

With the assistance of AID, interaction effects can be detected by observing different relationships between a predictor and a criterion among different subgroups of the sample. For example, the relationship between predictor A and the criterion may be seen clearly by plotting the mean criterion score of persons in each response category of the predictor. Corresponding plots for various subgroups can then be compared in terms of differences among the slopes of these plottings. Two hypothetical plots are illustrated in Figure 1. The figure shows that predictor A is positively associated with the criterion only among persons having low scores on predictor B. Among those with high scores on predictor B the opposite is true: predictor A is negatively associated with the criterion. Note, however, that this interaction is confined to only two predictors. Typically, the interactions identified by AID are far more complicated and will appear at first glance to be confined to comparatively small segments of the sample. The interaction illustrated by Figure 1 may, for example, be isolated only in that segment of the sample defined by a unique configuration of several other predictors C,D,E,F, etc. For this reason the generality of each interaction detected by AID must be determined. In order to make this determination each suspected interaction between predictors A and B is tested on the full sample of people. A cross-tabulation is made of scores on predictor A and the criterion for different levels of the supposedly interacting predictor B. On the basis of these cross tabulations gamma



x--x = Data obtained from subgroup B_1 (i.e., those with low scores on Predictor B)

●——● = Data obtained from a subgroup B_2 (i.e., those with high scores on Predictor B)

Figure 1.--Hypothetical Interaction Effect

coefficients of association between predictor A and the criterion are computed for different levels of predictor B. If the relationships between predictor A and the criterion are shown by the cross-tabulations and the gammas to be substantially different for different levels of B, an interaction effect may be sufficiently widespread in the sample to justify the construction of an interaction term to be used in the MCA analysis.

The AID analysis relating the 33 Quality of Employment predictors to Jobsat '72 indicated that most of the associations were monotonic and positive. Most departures from montonicity involved unusually low or high criterion scores for single class intervals of the predictors --occasional "blips" in what were otherwise orderly, positively monotonic relationships. Moreover, most of these "blips" occurred where the class interval contained so few workers as to make the reliability of the "blip" suspect. Only thirteen AID-identified interactions appearing in what were often quite isolated subsamples of workers were sufficiently great to warrant testing on the full sample. This testing, involved the use of cross-tabulations and gamma coefficients just described, indicated that seven of the interactions initially detected by AID in various subsamples of workers were not present in the analysis sample as a whole. The differences between gammas necessary for identifying interaction were all of a zero-order. The remaining six interactions identified by AID held up somewhat better examined on the whole analysis sample. These interactions were nevertheless not very impressive. Differences in gammas leading to the selection of these interactions ranged from .10 to .29. These interactions among Quality of Employment measures are listed in Table 2.

TABLE 2

INTERACTIONS AMONG QUALITY OF EMPLOYMENT PREDICTOR VARIABLES

Interacting variables	Form of interaction[a]
"It would be easy for worker to find a new job as good as his present one" with "Worker's job did not prevent him from using skills he would like to be using"	Unrelated for workers who did not have unused skills, negatively related for workers who did have unused skills.
"Worker had enough facts and information to do his job well" with "Worker's supervisor encouraged new ways of working"	More positively related for workers whose supervisor did not encourage new ways of working.
"Worker's supervisor did not insist that those under him work hard" with "Worker's job required that he be creative"	Negatively related for workers whose job involved creativity, positively related for workers whose job did not involve being creative.
"Worker's supervisor did not insist that those under him work hard" with "Worker's supervisor encouraged new ways of working"	Unrelated for workers whose supervisor encouraged new ways of working, positively related for workers whose supervisor did not encourage new ways of working.
"Worker's supervisor encouraged new ways of working" with "Worker's job did not prevent him from using skills he would like to be using"	More positively related for workers who did not have unused skills.
"Worker's supervisor encouraged new ways of working" with "Worker's supervisor maintained high standards in his work"	More positively related for workers whose supervisor did not maintain high standards in his work.

[a]Expressions describe the relationship between job satisfaction and the first listed predictor in an interacting pair, for dichotomized levels of the second predictor.

The ultimate test of the utility of taking account of an interaction among Quality of Employment measures in explaining workers' overall satisfaction with their jobs does not, however, rest upon comparisons between gammas or slopes of regressions. It depends instead upon whether the Quality of Employment model that includes interaction terms is superior to a simpler model that assumes that the effects of Quality of Employment measures upon job satisfaction are strictly additive. To make this critical test, MCA was used to estimate the multiple correlations between Jobsat '72 and two sets of Quality of Work indicators. The first set, accommodating all observed interactions, employed as predictors 26 Quality of Employment predictors plus six interaction terms based on the interactions described in Table 2. The second set consisted of all 33 Quality of Employment predictors under the assumption that their effects would be strictly additive; no provision was made for interactions.

The data clearly showed that the model based on the set of predictors that attempted to take into account the AID-identified interactions was no better in predicting overall job satisfaction than was the far simpler model that assumed no interactions. The multiple correlation between the latter set of 33 predictors and Jobsat '72 was .73. The more complex interactive model that included the six interaction term and excluded as separate predictors the main effects of the predictors used in these terms yielded a multiple correlation of .74. In short, the whole search guided by AID for complex interactions among Quality of Employment indicators let nowhere. The data showed that the "best" model for predicting overall job satisfaction from the 33 indicators

of the quality employment was a simple, linear, additive one that could not be improved upon by the introduction of complex interaction terms.

Evaluating the fit of the model

Evaluating an empirically-derived model which purports to explain job satisfaction involves answering two general questions: how well does the model as a whole explain criterion variance? how do the predictors differ in the importance of their relative contributions to the criterion? The latter questions if, of course, relevant only if the model's overall fit is adequate. If all the predictors taken together cannot account for much variance in the criterion, the relative importance of the predictors is hardly interesting. The more general issues of the overall predictive efficiency of the model are discussed below, reserving the question of the relative effectiveness of individual predictors to a later section.

The measure of adequacy of fit computed by MCA for the model as a whole is a multiple R* which represents the correlation between workers' predicted job satisfaction scores as estimated by MCA and their actual scores. Using the final set of 33 predictors and assuming no interactions, this value was .73. When squared, it equalled .53, indicating that the total set of 33 Quality of Employment predictors were able to explain 53 per cent of the variance in overall job satisfaction scores.

While this appears to be a substantial proportion of variance explained by the model, two issues must be resolved before the model is accepted. One is concerned with spurious correlations between predictors

---

*All multiple R's and R^2's reported here are values adjusted by MCA to correct for capitalization on chance associations between predictors and the criterion. The unadjusted values of R and R^2 which did not allow for shrinkage were somewhat higher.

and the criterion, and the other with the replicability of the model among more homogeneous subsamples of workers.

Spurious correlations between predictors and criterion.--A potential problem with using Jobsat '72 as a criterion was the possible capitalization on the fact that both the Quality of Employment predictors and the Jobsat '70 component of Jobsat '72 were based on questions that referred to specific facets of the job. In addition, the selection of predictors was guided by their judged relevance to four of the five general factors underlying Jobsat '70 (i.e., Comfort, Challenge, Financial Rewards, and Resources). Similarity of the job facets referred to by the questions comprising the Jobsat '70 index and those included as Quality of Employment predictors may as a result have produced a spuriously high multiple R between the predictors and the Jobsat '72 criterion since half the variance of the latter was attributable to its Jobsat '70 component.

The remainder of the variance of Jobsat '72 was attributable to its other component, Facet-free Job Satisfaction. Since the questions upon which Facet-free Job Satisfaction were based were very general ones and in no way referred to specific facets of the job, there was no possibility that the predictors could be spuriously correlated with Facet-free Job Satisfaction by virtue of their dealing with the same job facets. Two additional MCA analyses were therefore performed using the basic set of 33 predictors, one using Facet-free Job Satisfaction as a criterion and the other using Jobsat '70 as a criterion. Evidence for a spuriously high correlation between the predictors and the Jobsat '72 criterion would have been provided if MCA had generated a low multiple R

between the predictors and Facet-free Job Satisfaction and a considerably higher one between the same predictors and Jobsat '70. In fact, the two multiple R's were virtually identical. The multiple R for Facet-free Job Satisfaction was .59 (R^2 = .35) and that for Jobsat '70 was .60 (R^2 = .36). Jobsat '70 was not better explained by the predictors grounded in references to particular job facets than was Facet-free Job Satisfaction. Jobsat '72 appeared, therefore, not to have a spuriously high correlation with the Quality of Employment predictors due to its Jobsat '70 component being used on facet-specific questions.

Jobsat '70 and Facet-free Job Satisfaction were based on quite different approaches to the measurement of overall job satisfaction. The former estimated overall satisfaction from an aggregate of worker's ratings of satisfaction with specific facets of his job. In this regard it is like the Job Description Index (Smith, Kendall, & Hulin, 1969). The Facet-free measure, on the other hand, contained questions concerning only a worker's overall affective reaction to his job and never dealt with such specifics as pay, co-workers, how interesting his job was, etc. Although the two measures represented only alternative strategies for measuring the same overall affective reaction, their correlation in the present data was only .46. Combining them with equal weights in the Jobsat '72 measure therefore resulted in a considerable reduction of the reliability of the resultant measure. Their respective reliabilities were .86 and .74, but the reliability of the combined Jobsat '72 measure was only .63. Combining the two measures appears to have produced a composite that was at the same time less reliable (in the sense of homogeneity) than either component but more valid, where validity was

estimated by the measure's multiple R with the independent Quality of Employment predictors. The multiple R of the 33 predictors with the composite Jobsat '72 criterion (.73) was higher than with either of the latter's two components (.60 and .59). In addition, this multiple R was even higher than Jobsat '72's reliability (.63). It is possible that combining the two job satisfaction measures had the effect of reducing the unique methods' variance of each measure so as to produce a composite that was less homogeneous and yet more valid than either of its two components.

Replicability of the fit of the model using data from selected subsamples.--Although the study's empirically-derived model of job satisfaction was a generally applicable one in the sense that it was derived from data obtained from a national sample of workers, it might have been considerably less successful when applied to any particular group of workers in the population. An attempt was therefore made to replicate the model among several subsamples of workers that were more demographically homogeneous than the total sample. The eight subsamples used for this purpose were distinguished in terms of sex, race, age, and educational level.* For each of these eight subsamples MCA was used to relate the 33 Quality of Employment predictors to the Jobsat '72

*No attempt was made to replicate the model among subsamples defined by such occupational characteristics as collar color, occupational status, specific occupation, or type of industry--variables which at times seem to constitute the life's blood of studies of working conditions or job satisfaction. These variables were regarded as summary indicators of ill-defined aggregates of working conditions and demographic variables for which far more direct measures were available in the study's measures of Quality of Employment and demographic characteristics. A later paper in this series will examine the question of whether job satisfaction can be best predicted from occupational characteristics, demographic variables, or Quality of Employment indicators.

criterion. The multiple R's and R^2's produced by these analyses are shown in Table 3.

Differences between the R and R^2 based on the total sample of 1327 and those based on the eight subsamples were generally not very large. The largest differences occurred where the subsample sizes were smallest. Andrews et al. (1967) stipulate that the number of cases required for using MCA should far exceed the degrees of freedom contained in the model. The job satisfaction model replicated in Table 3 had 132 degrees of freedom (determined by substracting 33 predictors from the cross-product of the 33 predictors and the maximum five coding categories used for each predictor). A small number of people relative to the available degrees of freedom generally results in too few cases falling into many predictor response categories for the computation of stable criterion means for people in these categories, thereby increasing the estimated error in a model. That the number of Blacks in the sample barely exceeded the available degrees of freedom may therefore have accounted for the comparatively poor replicability (R = .56) of the model among the Black subsample. The other two subsamples with R's in the .60's (e.., workers who were 45 years old or older and workers who had at least some college education) were also comparatively small. The rank-order correlation between the R's in Table 3 and the number of workers upon which these R's were based was .67.

To obtain further evidence concerning the effects of small sample size on the fit of the model, an MCA relating the 33 Quality of Employment predictors to Jobsat '72 was performed for a random sample of 184 wage-and-salaried workers. A multiple R of only .23 and R^2 of .05

TABLE 3

ADEQUACY OF FIT OF MODEL AS INDICATED BY R AND R^2 IN EIGHT DEMOGRAPHICALLY DEFINED SUBSAMPLES OF WORKERS

Sample	R	R^2	N
Total sample	.73	.53	1327
Sex			
Men	.71	.51	816
Women	.67	.45	509
Race			
White	.71	.51	1161
Black	.56	.32	148
Age			
16-44 years old	.73	.53	840
45 years old or older	.61	.37	480
Education			
High school or less	.72	.52	915
Some college or more	.62	.39	410

resulted. Even with a sample slightly larger than that comprised by Black workers, a very poor fit of the model was obtained. The instability of R and R^2 under conditions of small sample size was further indicated by the degree of adjustment in R that was made by MCA to correct computations for capitalization on chance. Where extensive adjustments have had to be made by MCA, sample size might well be considered to have been inadequate. The downward adjustment in R for the full sample of 1327 was .04; for the subsample of 410 workers with at least some college education, the drop was .18; for the random sample of 184 and for the 148 Black workers, the drops were .58 and .53, respectively. Adjustments for chance were inversely related to sample size (the rank-order correlation between size of the subsamples and degree of downward adjustment in R was -.97), and became extensive at a point between sample sizes of 410 and 184. Although the replicability of the model among the selected eight demographically defined subsamples thus appeared to be to a considerable extent contingent upon the number of workers in each subsample, there was no way of determining if the least successful replications were due to differences in sample size as opposed to more meaningful differences among subsamples in terms of the applicability to them of the general model. Overall, however, the results offer some evidence for replicability among homogeneous subgroups of the sample.

Evaluating the relative contributions of predictors

The data presented above indicated only that a very diverse set of 33 Quality of Employment predictors were able to explain a considerable amount of the variance of workers' overall feelings of job satisfaction. Nothing was said about the relative contribution of each of

these predictors to overall job satisfaction. There remains as a result the unresolved question of which characteristics of the jobs of American workers are most "important" to them where the "importance" of any facet of the job is defined as its contribution to workers' job satisfaction.

MCA provided two methods of estimating the importance of various job facets to workers. Both methods equated the importance of any job facet with the degree of association between the quality of employment the worker experienced with regard to the facet and his overall job satisfaction. The first of these methods determined for the Quality of employment with regard to each aspect of workers' jobs an eta coefficient which, when squared, indicated the proportion of job satisfaction variance accounted for by the job facet in questions considered singly, with no adjustments made for the concurrent effects of other predictors. Eta therefore represented only the first-order correlation between the criterion and each of the Quality of Employment predictors considered independently. The second method produced instead a beta coefficient which, when squared, indicated the proportion of job satisfaction variance accounted for by each Quality of Employment predictor with the effects of other predictors held constant. Computation of betas incorporated an adjustment for the extent to which any predictor was correlated with another predictor. The eta and beta coefficients thus provided distinctly different but complementary information.

Etas and beta coefficients computed by MCA on the full sample of 1327 wage-and-salaried workers for each of the 33 Quality of Employment predictors are shown respectively in the first and third columns of

numbers in Table 4. Columns two and four indicate the rank of each predictor in terms of its eta or beta, low-numbered rank (e.g., 1) representing a large eta or beta. The predictors are grouped according to the four factors of Challenge, Comfort, Financial Rewards, and Resources. Within each factor the predictors are listed in descending order of their eta coefficients.

Variations in the magnitudes of eta and especially beta coefficients were not great. It even proved necessary to carry all values out to three places to avoid large numbers of tied ranks. Although differences in ranks did not therefore always reflect large differences in sizes of etas or betas, the highest ranking predictors may nevertheless be regarded as the more important contributors to overall job satisfaction.

Identifying the most important predictors was, however, complicated by the low correspondence between etas and betas. Since most of the predictors were correlated with at least one other predictor, betas tended to be low even when etas were high. Depending upon whether etas or betas were selected as better indicators of the contribution of each predictor, different sets of predictors could have been identified as the most important ones. For example, a predictor with a high eta and a low beta (e.g., Worker's supervisor encouraged new ways of working) was important by virtue of its first-order relationship with job satisfaction (as indicated by its high eta) but clearly shared some of its importance with at least one other predictor (as indicated by its relatively lower beta). A predictor with an eta and a beta that were both relatively high (e.g., Worker's supervisor maintained high standards in his

TABLE 4

CONTRIBUTIONS OF INDIVIDUAL QUALITY OF EMPLOYMENT PREDICTORS TO JOB SATISFACTION

Quality of employment predictors[a]	Full sample wage and salaried (N=1327)			
	Eta	Rank	Beta	Rank
Challenge				
Worker's supervisor encouraged new ways of working	.360	1	.082	14
Worker's job required high level of skill	.305	3	.124	7
Worker's job allowed freedom as to how to do his work	.299	4	.093	11
Worker's job did not prevent him from using skills he would like to be using	.283	5	.174	1
Worker's supervisor let his subordinates alone unless they asked for help	.279	6	.059	26
Worker's job required learning new things	.271	7	.025	33
Worker's job required that he be creative	.264	8.5	.077	18
Worker's job involved doing a variety of things	.248	14	.160	2
Worker had exactly the education his job required	.243	15	.054	29
Worker's job allowed him to make a lot of decisions on his own	.242	16.5	.068	23
Worker had enough authority to tell others what to do	.229	18	.069	22
Worker's employer made available to him a training program for improving his skills	.156	26	.076	19
Resources				
Worker's supervisor maintained high standards in his work	.350	2	.152	3
Worker's supervisor knew his own job well	.260	10	.074	20
Worker had enough help from others with whom he worked	.258	11	.072	21

TABLE 4--(continued)

Quality of employment predictors[a]	Full sample wage and salaried (N=1327)			
	Eta	Rank	Beta	Rank
Worker had enough machinery and equipment to do his job well	.212	21	.081	16
Worker had enough facts and information to do his job well	.184	23	.041	32
Comfort				
Worker had no problems with his hours, his work schedule, or with working overtime	.264	8.5	.127	6
Worker did not experience dangerous or unhealthy conditions on his job	.256	12	.105	10
Worker had enough time to do what others expected of him	.249	13	.132	5
The physical conditions of worker's job were pleasant and comfortable	.242	16.5	.113	8
Worker had no problems with transportation to and from work	.168	24	.067	24
Worker's job did not require that he work very fast	.164	25	.058	27
Worker mostly determined whether he would work overtime on his job	.155	27	.043	31
Worker did not work excessive hours	.108	29	.081	16
Worker's job did not require that he work very hard	.098	30	.055	28
Worker's supervisor did not insist that those under him work hard	.097	31	.086	13
Worker did not have to take much time to get to work	.083	32	.053	30

TABLE 4--(continued)

Quality of employment predictors[a]	Full sample wage and salaried (N=1327)			
	Eta	Rank	Beta	Rank
Financial rewards				
Worker's employer made many fringe benefits available to him	.218	19	.141	4
Worker desired no additional fringe benefits	.217	20	.081	16
Worker was a full time worker who received a high income from his job	.211	22	.106	9
It was unlikely that worker's job would be automated	.144	28	.089	12
It would be easy for worker to find a new job as good as his present one	.054	33	.061	25

[a]Predictors listed according to Quality of Employment factors, and within factors, by size of eta for full sample (N=1327).

work), had a strong first-order relationship with job satisfaction that was shared to a lesser extent with other predictors. The case of a predictor with only a moderate eta but a high beta (e.g., Worker's job involved doing a variety of things) was muddier still. Such a predictor explained relatively less job satisfaction variance than a number of others, but as a result of its low associations with other predictors it made a rather unique contribution. Comparing the relative importance of the variety of job facets represented by the 33 predictors was therefore difficult because of the restricted range of betas associated with these predictors and the differences between the etas and betas. Only one thing was certain: that no single job facet stood head-and-shoulders above the others as the facet that was most important to workers' job satisfaction.

Such facet-by-facet comparisons may not, however, be very meaningful in trying to understand what is important to workers. An earlier paper in this series (Quinn, 1971) attempted through an entirely different strategy to make similar estimates of importance. Instead of defining the importance of a job facet in terms of its contribution to overall job satisfaction, the data upon which this earlier report was based were workers' ratings of what was most important to them in an "ideal" job. Comparisons between workers' importance ratings presented in that report and those obtained in individual previous studies indicated that there existed little statistically reliable correspondence. Enormous statistical disagreement was also found to exist among the several earlier studies that were re-examined. In spite of these statistical disagreements, many of the general conclusions concerning workers'

importance ratings made in the Working Conditions Survey and in previous investigations did not differ greatly. The earlier report suggested that much of the observed discontinuity between statistical disagreement and conceptual consensus may have resulted from:

> an unwarranted preoccupation with the details of importanc ratings, a concern, for example, with whether workers regarded job security as more important than physical working conditions. Excessive emphasis appears to have been placed upon the importance assigned to particular facets of the job. Comparatively little effort has been made to isolate a limited number of more basic dimensions underlying these facets and to evaluate importance with reference to these basic dimensions rather than with reference to phenotypic job facets.

Lest the whole issue of what is important to American workers becomes bogged down by overly exquisite considerations of separate job facets, five basic dimensions of importance were defined through a factor analysis of importance ratings (Cobb & Quinn, 1971). These five dimensions not only provided a statistically justified criterion for indexing workers' importance and job satisfaction ratings but provided as well a useful language for summarizing the study's findings. These five factors also governed the choice of variables used in the present report as Quality of Employment indicators. The 33 Quality of Employment indicators in Table 4 are therefore grouped in terms of their relevance to four of these five factors: Challenge; Resources; Comfort; and Financial Rewards. No Quality of Employment predictors were available for the fifth factor, Relations with Co-workers.

A facet-by-facet review of the data in Table 4 indicated that no single facet of the job was pre-eminently important. Could such a judgment be made when the focus was directed away from individual job facets to one of the four more general dimensions represented by these

facets? When only the etas in Table 4 were considered, Challenge was easily the most significant contributor to overall job satisfaction. Most of the high ranks of eta coefficients were associated with predictors included in the Challenge factor. The remaining ranks of eta coefficients were dispersed over the remaining three factors in such a way that it was difficult to estimate the relative importance of these three factors. It was certain only that, as evaluated by the eta coefficients, each of these three factors was less important than Challenge. When betas were considered, however, not even the pre-eminence of Challenge was substantiated. The highest ranks of the betas were, according to Table 4, distributed fairly evenly among the four factors.

The initial model developed through the joint use of AID and MCA was therefore able to explain a sizeable proportion of the variance (53%) of workers' job satisfaction in terms of workers' scores on the survey's 33 Quality of Employment indicators. The final version of the model, however, provided a few clear indications as to what was really most important to American workers. The 33-predictor model was useful primarily in failing to support any "simple and sovereign" theory of job satisfaction that maintains that the key to increasing job satisfaction is to improve working conditions with regard to one specific facet of a job. If there were such a key, it would obviously have been discovered long ago. The data disclosed only that there may be many such keys and that each of them may unlock the door to a dorridor that leads only to yet another door.

Although the job satisfaction model based on 33 predictors provided little indication as to which of the four dimensions of

Challenge, Resources, Comfort, and Financial Rewards was most important to workers, there remained yet another strategy for determining the relative importance of these four factors. This strategy involved not treating the 33 Quality of Employment measures as separate predictors but including them instead in four summary Quality of Employment indices which corresponded to the four factors in Table 4. In this consolidation the model lost some of its ability to explain job satisfaction variance. MCA analyses indicated that the 33 individual predictors had a multiple R of .73 (R^2 = .53) in their explanation of the variance of job satisfaction scores. A parallel analysis using the four consolidated indices rather than the 33 individual predictors indicated that the former had a multiple R of .66 (R^2 = .43).

The relative order of the four Quality of Employment indices in terms of the amount of variance of job satisfaction scores that they explained is shown in Table 5. Regardless of whether eta or beta was chosen to represent importance, the order of the four indices was the same: the Challenge predictors made the greatest contribution to overall job satisfaction, followed in order by Resources, Comfort, and Financial Rewards. Although, as indicated by the difference between each eta and its corresponding beta, all four indices shared some variance with at least one other index, Challenge retained the largest unique contribution* to overall job satisfaction. It was additionally

*The unique criterion variance explained by a predictor, which is approximated by squaring betas, can be found by excluding each predictor in turn from successive MCAs, and subtracting the resulting R^2's from the R^2 obtained with all the predictors together. The drop in R^2 due to the exclusion of a predictor indicates the proportion of criterion variance which only that predictor can explain. When applied to the four Quality of Employment indices, this strategy assigned to each the

TABLE 5

RELATIVE IMPORTANCE OF QUALITY OF EMPLOYMENT FACTORS IN EXPLAINING JOB SATISFACTION[a]

Factors	Proportion of job satisfaction variance	
	Eta^2	$Beta^2$
Challenge	.26	.17
Resources	.15	.08
Comfort	.11	.03
Financial Rewards	.07	.01

[a] R^2 for factors together was .43.

noteworthy that the Financial Rewards index was not only the weakest of the four indices in terms of its contribution to job satisfaction, but that virtually all the criterion variance that it did explain was also explained by other factors. It had virtually no unique variance.

Evaluating the replicability of the relative contributions of predictors using data from selected subsamples.--The issue of the replicability of the final 33-predictor model among more demographically honogeneous subsamples of workers involves two distinct questions: can the model explain as much job satisfaction variance for workers in these subsamples as it can for the sample of workers as a whole? to what extent is the order of predictors in the sample as a whole similar among workers in each demographically defined subsample? The first of these questions was answered earlier through comparisons of the R and R^2 terms based on data from the full sample of 1327 workers and data from eight subsamples distinguished in terms of sex, race, age, and education. The present section provides an answer to the second question.

The results of the MCA analysis using the 33 predictors for the full sample of wage and salaried workers has already been presented in Table 4. The results of eight parallel MCA analyses using data from eight demographically defined subsamples are presented in similar formats in Tables 6-9. The between-sample comparisons relevant to the issue of the replicability of the relative importance of predictors are, however, more conveniently summarized in Table 10. The data upon which Table 10 was based were the ranks of the etas and betas of the 33

---

following proportions of unique variance: Challenge = .15; Resources = .07; Comfort = .02; Financial Rewards = .00.

TABLE 6

CONTRIBUTIONS OF INDIVIDUAL QUALITY OF EMPLOYMENT PREDICTORS TO JOB SATISFACTION

Quality of employment predictors[a]	Males (N=816)				Females (N=509)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Challenge								
Worker's supervisor encouraged new ways of working	.400	1	.190	2	.305	4	.130	9.5
Worker's job required high level of skill	.274	9	.115	6	.316	3	.156	7
Worker's job allowed freedom as to how to do his work	.303	4	.087	16	.258	7	.113	15
Worker's job did not prevent him from using skills he would like to be using	.283	7	.188	3	.256	8	.157	6
Worker's supervisor let his subordinates alone unless they asked for help	.350	3	.114	7	.193	21	.098	18
Worker's job required learning new things	.279	8	.076	23.5	.222	16	.055	31
Worker's job required that he be creative	.302	5	.172	4	.159	24	.094	19
Worker's job involved doing a variety of things	.258	11	.098	12	.243	10.5	.093	20
Worker had exactly the education his job required	.230	17	.077	22	.231	14	.059	29
Worker's job allowed him to make a lot of decisions on his own	.239	14	.112	9.5	.218	17	.107	17
Worker had enough authority to tell others what to do	.233	16	.047	29	.199	20	.053	32
Worker's employer made available to him a training program for improving his skills	.156	27	.027	33	.136	25	.084	21

TABLE 6--(continued)

Quality of employment predictors[a]	Males (N=816)				Females (N=509)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Resources								
Worker's supervisor maintained high standards in his work	.352	2	.154	5	.356	1	.181	5
Worker's supervisor knew his own job well	.268	10	.039	32	.274	5	.223	2
Worker had enough help from others with whom he worked	.255	12	.075	25	.239	12	.070	25
Worker had enough machinery and equipment to do his job well	.185	22	.081	19.5	.244	9	.067	28
Worker had enough facts and information to do his job well	.172	24	.046	30	.203	19	.077	24
Comfort								
Worker had no problems with his hours, his work schedule, or with working overtime	.213	20	.081	19.5	.319	2	.200	4
Worker did not experience dangerous or unhealthy conditions on his job	.288	6	.112	9.5	.243	10.5	.082	22.5
Worker had enough time to do what others expected of him	.229	18	.082	18	.266	6	.114	14
The physical conditions of worker's job were pleasant and comfortable	.244	13	.097	13	.225	15	.112	16
Worker had no problems with transportation to and from work	.164	26	.076	23.5	.192	22	.082	22.5
Worker's job did not require that he work very fast	.169	25	.056	26	.126	26	.028	33
Worker mostly determined whether he would work overtime on his job	.200	21	.041	31	.119	28	.121	13

TABLE 6--(continued)

Quality of employment predictors[a]	Males (N=816)				Females (N=509)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Worker did not work excessive hours	.120	29	.088	14	.054	33	.127	12
Worker's job did not require that he work very hard	.118	30	.109	11	.083	31	.056	30
Worker's supervisor did not insist that those under him work hard	.130	28	.246	1	.107	30	.295	1
Worker did not have to take much time to get to work	.107	32	.053	27	.122	27	.068	27
Financial rewards								
Worker's employer made many fringe benefits available to him	.189	23	.048	28	.234	13	.210	3
Worker desired no additional fringe benefits	.218	19	.087	16	.213	18	.069	26
Worker was a full time worker who received a high income from his job	.234	15	.079	21	.116	29	.130	9.5
It was unlikely that worker's job would be automated	.114	31	.087	16	.191	23	.129	11
It would be easy for worker to find a new job as good as his present one	.098	33	.113	8	.070	32	.140	8

[a]Predictors listed according to Quality of Employment factors, and within factors, by size of eta for full sample (N=1327).

TABLE 7

CONTRIBUTIONS OF INDIVIDUAL QUALITY OF EMPLOYMENT PREDICTORS TO JOB SATISFACTION

Quality of employment predictors[a]	Whites (N=1161)				Blacks (N=148)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Challenge								
Worker's supervisor encouraged new ways of working	.367	1	.103	10.5	.293	11	.284	6
Worker's job required high level of skill	.304	3	.122	7	.273	15	.172	18.5
Worker's job allowed freedom as to how to do his work	.296	4	.111	9	.268	17.5	.099	30
Worker's job did not prevent him from using skills he would like to be using	.288	5	.173	1	.282	12	.172	18.5
Worker's supervisor let his subordinates alone unless they asked for help	.281	6	.078	18	.298	9	.226	12.5
Worker's job required learning new things	.277	7	.052	30	.151	30	.100	29
Worker's job required that he be creative	.260	9	.067	24.5	.311	7	.232	11
Worker's job involved doing a variety of things	.234	17	.145	3	.221	21	.107	28
Worker had exactly the education his job required	.239	16	.063	26	.179	27	.071	33
Worker's job allowed him to make a lot of decisions on his own	.245	12.5	.092	14.5	.160	28	.165	21
Worker had enough authority to tell others what to do	.242	15	.070	23	.187	26	.143	26
Worker's employer made available to him a training program for improving his skills	.159	25	.072	20	.119	32	.169	20

TABLE 7--(continued)

Quality of employment predictors[a]	Whites (N=1161)				Blacks (N=148)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Resources								
Worker's supervisor maintained high standards in his work	.340	2	.160	2	.373	2	.245	8
Worker's supervisor knew his own job well	.228	18	.077	19	.444	1	.269	7
Worker had enough help from others with whom he worked	.254	10	.071	21.5	.268	17.5	.078	32
Worker had enough machinery and equipment to do his job well	.203	21.5	.090	16	.319	6	.092	31
Worker had enough facts and information to do his job well	.181	23	.047	31	.301	8	.178	17
Comfort								
Worker had no problems with his hours, his work schedule, or with working overtime	.262	8	.133	5	.331	4	.148	25
Worker did not experience dangerous or unhealthy conditions on his job	.245	12.5	.092	14.5	.369	3	.391	2
Worker had enough time to do what others expected of him	.248	11	.135	4	.277	13	.179	16
The physical conditions of worker's job were pleasant and comfortable	.244	14	.120	8	.216	22.5	.156	22.5
Worker had no problems with transportation to and from work	.152	27	.059	27.5	.296	10	.355	3
Worker's job did not require that he work very fast	.172	24	.046	32	.216	22.5	.136	27

TABLE 7--(continued)

Quality of employment predictors[a]	Whites (N=1161)				Blacks (N=148)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Worker mostly determined whether he would work overtime on his job	.156	26	.059	27.5	.162	29	.242	9
Worker did not work excessive hours	.107	30	.102	12	.204	24	.156	22.5
Worker's job did not require that he work very hard	.113	29	.057	29	.130	31	.187	15
Worker's supervisor did not insist that those under him work hard	.100	31	.103	10.5	.104	33	.234	10
Worker did not have to take much time to get to work	.058	32	.041	33	.269	16	.189	14
Financial rewards								
Worker's employer made many fringe benefits available to him	.214	19	.129	6	.229	19	.289	5
Worker desired no additional fringe benefits	.203	21.5	.098	13	.328	5	.153	24
Worker was a full time worker who received a high income from his job	.207	20	.087	17	.222	20	.301	4
It was unlikely that worker's job would be automated	.128	28	.071	21.5	.275	14	.407	1
It would be easy for worker to find a new job as good as his present one	.054	33	.067	24.5	.188	25	.226	12.5

[a]Predictors listed according to Quality of Employment factors, and within factors, by size of eta for full sample (N=1327).

TABLE 8

CONTRIBUTIONS OF INDIVIDUAL QUALITY OF EMPLOYMENT PREDICTORS TO JOB SATISFACTION

Quality of employment predictors[a]	Age 16-44 years old (N=840)				Age 45 years old or older (N=480)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Challenge								
Worker's supervisor encouraged new ways of working	.367	1	.081	19	.341	1	.110	12.5
Worker's job required high level of skill	.344	3	.127	5	.216	12	.100	16
Worker's job allowed freedom as to how to do his work	.313	6.5	.101	10.5	.250	7	.105	14
Worker's job did not prevent him from using skills he would like to be using	.300	9	.170	4	.212	13	.168	3
Worker's supervisor let his subordinates alone unless they asked for help	.256	14	.105	8	.283	4	.082	23
Worker's job required learning new things	.329	4	.057	27	.194	19	.061	26
Worker's job required that he be creative	.313	65	.083	18	.207	18	.091	18.5
Worker's job involved doing a variety of things	.319	5	.202	1	.141	26	.065	25
Worker had exactly the education his job required	.227	17	.050	29	.211	14.5	.043	29.5
Worker's job allowed him to make a lot of decisions on his own	.289	10	.064	23	.169	24	.116	9
Worker had enough authority to tell others what to do	.225	18	.049	30	.211	14.5	.090	21
Worker's employer made available to him a training program for improving his skills	.125	28	.068	22	.226	11	.091	18.5

TABLE 8--(continued)

Quality of employment predictors[a]	Age 16-44 years old (N=840)				Age 45 years old or older (N=480)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Resources								
Worker's supervisor maintained high standards in his work	.349	2	.188	2	.326	2	.128	6
Worker's supervisor knew his own job well	.230	16	.061	24.5	.301	3	.184	1
Worker had enough help from others with whom he worked	.264	11	.101	10.5	.237	8	.025	32
Worker had enough machinery and equipment to do his job well	.180	23	.079	21	.234	9	.135	5
Worker had enough facts and information to do his job well	.175	24	.043	32	.185	21	.043	29.5
Comfort								
Worker had no problems with his hours, his work schedule, or with working overtime	.305	8	.183	3	.168	25	.115	10
Worker did not experience dangerous or unhealthy conditions on his job	.260	12	.088	16.5	.230	10	.110	12.5
Worker had enough time to do what others expected of him	.257	13	.114	6	.188	20	.090	21
The physical conditions of worker's job were pleasant and comfortable	.244	15	.106	7	.208	17	.090	21
Worker had no problems with transportation to and from work	.166	26	.080	20	.180	23	.123	8
Worker's job did not require that he work very fast	.208	19	.041	33	.122	29	.114	11

TABLE 8--(continued)

Quality of employment predictors[a]	Age 16-44 years old (N=840)				Age 45 years old or older (N=480)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Worker mostly determined whether he would work overtime on his job	.189	21	.088	16.5	.126	27.5	.021	33
Worker did not work excessive hours	.116	29	.093	15	.105	32	.057	27
Worker's job did not require that he work very hard	.080	31	.056	28	.107	30.5	.046	28
Worker's supervisor did not insist that those under him work hard	.102	30	.103	9	.126	27.5	.143	4
Worker did not have to take much time to get to work	.072	32	.046	31	.181	22	.096	17
Financial rewards								
Worker's employer made many fringe benefits available to him	.177	25	.094	13.5	.279	5	.183	2
Worker desired no additional fringe benefits	.184	22	.060	26	.262	6	.124	7
Worker was a full time worker who received a high income from his job	.206	20	.094	13.5	.210	16	.104	15
It was unlikely that worker's job would be automated	.159	27	.099	12	.107	30.5	.078	24
It would be easy for worker to find a new job as good as his present one	.063	33	.061	24.5	.083	33	.036	31

[a]Predictors listed according to Quality of Employment factors, and within factors, by size of eta for full sample (N=1327).

TABLE 9

CONTRIBUTIONS OF INDIVIDUAL QUALITY OF EMPLOYMENT PREDICTORS TO JOB SATISFACTION

Quality of employment predictors[a]	High school or less (N=915)				Some college or more (N=410)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Challenge								
Worker's supervisor encouraged new ways of working	.315	2	.104	16	.421	1	.087	23
Worker's job required high level of skill	.280	7	.107	13	.329	5	.144	6.5
Worker's job allowed freedom as to how to do his work	.296	4	.107	13	.269	11	.031	33
Worker's job did not prevent him from using skills he would like to be using	.227	15	.138	3	.374	3	.231	1
Worker's supervisor let his subordinates alone unless they asked for help	.293	5	.090	20.5	.231	13	.090	22
Worker's job required learning new things	.217	18	.060	26	.390	2	.067	28
Worker's job required that he be creative	.226	16	.123	6	.327	6	.055	30
Worker's job involved doing a variety of things	.214	19	.125	5	.303	8	.168	4
Worker had exactly the education his job required	.235	13	.046	30	.270	10	.096	19
Worker's job allowed him to make a lot of decisions on his own	.203	20	.056	27	.319	7	.181	3
Worker had enough authority to tell others what to do	.221	14	.034	33	.201	19	.077	26
Worker's employer made available to him a training program for improving his skills	.156	26	.078	22	.135	27	.034	32

TABLE 8--(continued)

Quality of employment predictors[a]	Age 16-44 years old (N=840)				Age 45 years old or older (N=480)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Worker mostly determined whether he would work overtime on his job	.189	21	.088	16.5	.126	27.5	.021	33
Worker did not work excessive hours	.116	29	.093	15	.105	32	.057	27
Worker's job did not require that he work very hard	.080	31	.056	28	.107	30.5	.046	28
Worker's supervisor did not insist that those under him work hard	.102	30	.103	9	.126	27.5	.143	4
Worker did not have to take much time to get to work	.072	32	.046	31	.181	22	.096	17
Financial rewards								
Worker's employer made many fringe benefits available to him	.177	25	.094	13.5	.279	5	.183	2
Worker desired no additional fringe benefits	.184	22	.060	26	.262	6	.124	7
Worker was a full time worker who received a high income from his job	.206	20	.094	13.5	.210	16	.104	15
It was unlikely that worker's job would be automated	.159	27	.099	12	.107	30.5	.078	24
It would be easy for worker to find a new job as good as his present one	.063	33	.061	24.5	.083	33	.036	31

[a]Predictors listed according to Quality of Employment factors, and within factors, by size of eta for full sample (N=1327).

TABLE 9--(continued)

Quality of employment predictors[a]	High school or less (N=915)				Some college or more (N=410)			
	Eta	Rank	Beta	Rank	Eta	Rank	Beta	Rank
Worker mostly determined whether he would work overtime on his job	.139	28	.040	32	.230	14	.101	15.5
Worker did not work excessive hours	.114	31	.095	18	.127	29	.056	29
Worker's job did not require that he work very hard	.137	29	.055	28	.051	33	.052	31
Worker's supervisor did not insist that those under him work hard	.135	30	.076	23	.068	31	.091	20.5
Worker did not have to take much time to get to work	.099	32	.067	25	.098	30	.128	11
Financial rewards								
Worker's employer made many fringe benefits available to him	.224	17	.157	1	.204	18	.080	25
Worker desired no additional fringe benefits	.239	11	.104	16	.141	26	.110	13
Worker was a full time worker who received a high income from his job	.200	21	.111	10.5	.248	12	.136	8
It was unlikely that worker's job would be automated	.149	27	.127	4	.130	28	.025	24
It would be easy for worker to find a new job as good as his present one	.081	33	.090	20.5	.056	32	.101	15.5

[a]Predictors listed according to Quality of Employment factors, and within factors, by size of eta for full sample (N=1327).

TABLE 10

RANK-ORDER CORRELATIONS OF MCA ETAS AND BETAS
FOR DEMOGRAPHIC SUBGROUPS OF SAMPLE

Correlation computed	MCA coefficient	Sex		Race		Age		Education	
		Men (N=816)	Women (N=509)	White (N=1161)	Black (N=148)	16-44 years old (N=840)	45 years old or older (N=480)	High school or less (N=915)	Some college or more (N=410)
Total sample (N=1327)	ETA	.93	.83	.98	.48	.93	.68	.90	.83
	BETA	.43	.60	.92	.15	.80	.48	.79	.31
Within demographic pair	ETA	.66		.38		.47		.60	
	BETA	.35		.01		.18		.11	

predictors that ppear in Tables 4, and 6-9. The top half of Table 10 presents the rank-order correlations between the ranks of the predictors for the full sample of 1327 and analogous ranks for the eight demographic subsamples. The bottom half of the table presents the rank-order correlation between the ranks of predictors for each pair of demographic subsamples (e.g., men versus women).

In terms of eta coefficients the replicability among the eight subsamples of the model based on the full sample was generally high. The greatest failure to replicate was observed among the subsample of Black workers; the correlation between the ranks of the etas among whites and the ranks among Blacks was also low. Not coincidentally, the Black subsample was the smallest of the eight subsamples. It was shown earlier that the replicability of the full-sample multiple R was highly dependent upon the size of the replication sample. The same was true with the etas. When an attempt was made to replicate the model on a sample of 184 randomly selected workers, the rank-order correlation between the ranks of the full-sample etas and those based on data from the randomly selected subsample was only .55. Failure to replicate the model adequately among the small subsample of Black workers was therefore more likely to have resulted from the subsample being small in size rather than from its racial composition.

The stability of the beta coefficients was considerably less than that of the etas (Table 10). The greatest lack of correspondence between full-sample and subsample betas occurred among college-educated workers and, even more strikingly, among Blacks. Correspondingly, the rank-order correlations between the betas of the two educationally-defined

subsamples and the two racially defined ones were the lowest of the four comparisons. As was the case with etas the replicability of the betas appeared highly contingent upon the number of cases in the replication subsample. Additional qualifications may also be placed on the interpretation of rank-order correlations based on ranks of beta coefficients. First, both among the full sample and the eight replication subsamples, the range of observed betas was quite narrow. Consequently, a relatively small shift in the size of a beta from subsample to subsample could have produced a sizeable change in a predictor's rank and a consequent lowering of the rank order correlation based on these ranks. Second, a beta is somewhat vulnerable to shifts in size from subsample to subsample because its magnitude is affected not only by a predictor's relationship to the criterion, but by its associations with other predictors. Relatively minor differences in correlations among predictors, from one subsample to another (which may be attributable to sample size) could alter the size of a beta enough to effect a change in rank. This could not safely be interpreted as reflecting a significant difference in a predictor's contribution to job satisfaction for those subsamples.

Far greater replicability was observed with regard to the four summary Quality of Employment indices than with regard to the 33 individual Quality of Employment predictors. The top row of Table 11 shows that among the full sample of 1327 workers the order of importance of the four indices was Challenge, Resources, Comfort, and Financial Rewards. The etas in the remaining rows of Table 11 indicate an identical rank-ordering in all save one of the demographically defined subsamples. The single exception was the subsample of 148 Blacks, among

TABLE 11

RELATIVE IMPORTANCE OF QUALITY OF EMPLOYMENT INDICES IN EXPLAINING JOB SATISFACTION FOR EIGHT DEMOGRAPHICALLY DEFINED SUBGROUPS OF WORKERS

Sample	N	Challenge		Resources		Comfort		Financial rewards	
		Eta	Beta	Eta	Beta	Eta	Beta	Eta	Beta
Total sample	1327	.51	.41	.38	.29	.34	.18	.26	.11
Sex									
Men	816	.50	.40	.38	.28	.35	.18	.26	.11
Women	509	.45	.36	.38	.30	.30	.18	.23	.13
Race									
White	1161	.51	.42	.39	.29	.32	.16	.26	.10
Black	148	.39	.31	.46	.36	.40	.27	.18	.15
Age									
16-44 years old	840	.53	.43	.36	.26	.34	.18	.27	.12
45 years old or older	480	.43	.35	.39	.35	.28	.13	.25	.13
Education									
High school or less	915	.48	.39	.40	.31	.35	.19	.26	.12
Some college or more	410	.53	.46	.33	.18	.28	.20	.22	.10

whom the order of importance of the four indices was Resources, Comfort, Challenge, and Financial Rewards.

The betas in Table 11 show additional differences in their order of importance among three subsamples: Blacks, older workers, and those with some college education. These three subsamples were, predictably, the smallest of the eight replication subsamples. Even the few reversals that did occur in the relative magnitudes of betas within these three subsamples were not very great. Given this, plus the limitation imposed by the comparatively small numbers of workers in these three subsamples, plus the tendency for betas to be particularly susceptible to differences that do not necessarily represent differences in the relationship between a predictor and a criterion (but which may instead be due to differences in relationships between a predictor and other predictors), these three exceptions did not appear especially important. For the most part, the order of the four indices was quite consistent from subsample to subsample. Even where the sample size was quite small (e.g., among Blacks). Financial Rewards was consistently the least important index. The primacy of Challenge was also exhibited in the various subsamples, especially among the relatively better-educated workers.

CONCLUSION

The major purpose of this report was to identify those facets of the jobs of American workers that were the most important determinants of their job satisfaction. To accomplish this purpose an empirically-derived model of job satisfaction was constructed that attempted to predict each worker's job satisfaction from the quality of employment he experienced with respect to 33 different facets of his job. These 33 disparate predictors embodied four more basic dimensions of the worker's job: the opportunities it provided him to perform challenging, interesting, and self-developing or self-fulfilling activities; the resources it provided him that could enable him to perform adequately at work; its providing of a work situation that was comfortable and untroubled, even "soft"; and its providing of financial rewards and job security.

Although the central empirical issue was the relative contributions of these job facets to job satisfaction, a prior issue was the overall adequacy of the quality of employment model in explaining job satisfaction. If the model could not have explained a substantial proportion of the variance of workers' job satisfaction scores, it would have made little sense to try to identify the job facets that constituted the model's best predictors. The data indicated that the final form of the 33-predictor quality of employment model was able to explain 53 per cent of the variance of the study's job satisfaction criterion measure. Judging the adequacy of this percentage depends upon the percentage of variance that a perfectly conceived and measured quality of employment model could reasonably be expected to explain. Clearly this figure is not 100 per cent. An explanation of <u>all</u> job satisfaction variance by

any model would demand an absolutely reliable measure of job satisfaction; this study's job satisfaction criterion, and all other existing measures of job satisfaction as well, fail to meet this standard of perfection. Few existing measure of job satisfaction have split-half reliabilities in excess of .90, a figure indicating that they may contain at most 81 per cent true score variance. If the model had explained 81 per cent of the variance of the Jobsat '72 criterion, its validity would have been suspect since this explanation would have implausibly indicated that absolutely none of the measured job satisfaction variance could be attributed to individual differences in personality or to factors external to the work situation. Certainly it may be reasonably expected, and has already been demonstrated, that individual differences in personality, reporting biases, motives, and expectations concerning the job contribute to job satisfaction. Job satisfaction may also be assumed to be affected by such matters external to the work situation as the worker's engagement in other roles as a source of gratification and the attitudes of members of the worker's family toward his work.

Moreover, the model itself provided an incomplete representation of job facets. It failed to include measures of quality of employment with regard to such facets of the job as promotional opportunities, the degree to which the job provided a worker with a sense that he was doing something that was important to society as a whole or his community, and his relations with his co-workers. His relations with his supervisor also received a perhaps overly light treatment in the quality of employment measures. Given these omissions from the set of quality of

employment predictors as well as the highly likely influence upon job satisfaction of the above-mentioned individual differences in personality and conditions not associated with work, it could not have reasonably been expected that the quality of employment model would have explained even so much as 81 per cent of the variance of workers' job satisfaction scores. That the model was able to explain 53 per cent of job satisfaction variance appeared therefore to provide an adequate testimony of the model's explanatory power. Indeed, in light of all the other possible determinants of workers' levels of job satisfaction, this 53 per cent figure even appears suspiciously high.

With the overall predictive efficacy of the quality of employment model thus established, the question remained as to which of the particular job facets assessed in terms of quality of employment were the best predictors of job satisfaction. Two statistics, etas and betas, were available for assessing the relative importance of job facets. The etas provided indications of the magnitude of first order-relationships between the quality of employment indicators and overall job satisfaction. The betas permitted a ranking of each of these job facets in terms of its relative contribution to job satisfaction while holding constant the effects of all the other quality of employment predictors. The problem of multicolinearity of predictors was surmounted only through the use of beta coefficients as indicators of importance. The array of betas failed, however, to clearly identify any single job facet as the most important. Although the facet with the highest beta coefficient was certainly more important than that with the lowest beta coefficient, absolute differences among betas were so small that the computation of

the coefficients had to be carried out to three decimal places to avoid many tied ranks. Even turning away from a consideration of the full range of all 33 betas and focusing instead upon the five job facets with the highest betas did not help to determine which general aspects of the job were most important to workers. No trend was apparent, since each of the four general factors of Challenge, Resources, Comfort, and Financial Rewards was represented by one of its facets appearing among the five predictors with the highest betas.

Thus examined individually, none of the 33 job facets stood out as a major determinant of job satisfaction. This does not mean that all the facets were unimportant in determining job satisfaction. On the contrary, most contributed a modest amount to job satisfaction, and the aggregation of all 33 contributed a great deal. What it <u>does</u> mean is that there was no single job facet that was so pre-eminent that it could be regarded as the "key" to explaining job satisfaction. The data therefore cautioned against making any such simplistic statements as "pay is the most important determinant of jobs satisfaction," or "providing workers with interesting jobs is the key to increasing their job satisfaction." Although individual job facets were not equally important determinants of job satisfaction, differences among them in terms of their explanatory power were not great, and these observed differences did not constitute patterns sufficiently meaningful to justify any sweeping generalizations about <u>the</u> most important contributor to job satisfaction.

A considerably more meaningful pattern emerged, however, when the analysis focused not upon the 33 separate quality of employment

predictors but upon the four general quality of employment indices that summarized and organized these predictors in terms of four dimensions: Challenge, Resources, Comfort, and Financial Rewards. Both the eta and beta rankings of these four indices led to the same conclusion: the job facets subsumed by the Challenge index were those most influential in determining workers' levels of job satisfaction. The other three general factors in decreasing order of importance were Resources, Comfort, and Financial Rewards. This ordering of the four indices was not only observed among the working population as a whole but was sustained among all subsamples of workers represented in sufficiently large numbers to permit a statistically reliable ordering.

In spite of the fact that the 33-predictor model was able to account for a substantial proportion of variation in job satisfaction, and to give some indications about which job facets were relatively the most important, a good deal of model development and refinement remains to be done. Clearly not all of the determinants of a worker's job satisfaction were represented in the model. Future research must attempt both to investigate facets of jobs overlooked or unrepresented in the data on which this analysis was based and to assess the effects upon job satisfaction both of individual differences in personality characteristics (such as motives, biases, and expectations) and of factors extraneous to the work situation (such as a worker's occupancy of non-work roles and the attitudes of members of his family toward his work). It will furthermore be necessary that this future research and subsequent analyses be conducted using a multivariate strategy, since it is the

extent to which these additional measures contribute uniquely to the explanation of job satisfaction which is of primary importance.

A second important area of emphasis is the development and validation of more adequate measures both of predictors and of the criterion itself, stressing both independence and objectivity. Care should be taken to ensure that predictor and criterion measures are sufficiently independent of each other to eliminate the need for concern about methods variance and its effects on the association between them. In the data on which the present analyses were based, for example, both the quality of employment measures and the job satisfaction measures were obtained during the same interview with reference to similar sets of job facets. While the possibility of a spurious relationship between the predictors and the criterion was tested and ruled out, the measurement strategy can be improved by making clearer operational distinctions between predictors and criterion measures. It is also desirable to minimize distortions arising from the use of human evaluators as sources of information. Quality of employment indicators therefore require validation through comparison with other measures based on alternative sources of information such as company records or reports by other workers making up the worker's role set. A further issue is the extent to which a worker's attitude such as his job satisfaction can be replaced in the analyses by more objective indicators such as job-related behavior. Establishing the link between quality of employment indicators and resultant job related behavior will require of future research not only improvement in the quality of employment indicators but also the identification of behaviors which are influenced by these conditions.

Finally, the most significant contribution to the development of improved models of job satisfaction can be made through the use of experimental research involving the manipulation of relevant variables. Causal inferences on the basis of this report must of course be made with considerable caution. Real effects can only be identified in the context of a research program which allows for causal variables to change and their effects to be charted.

REFERENCES

Andrews, F. M., Morgan, J. N., & Sonquist, J. A. The multiple classification analysis program. Ann Arbor, Mich.: Institute for Social Research, 1967.

Chant, S. M. F. Measuring the factors that make a job interesting. Personnel Journal, 1932, 11, 1-4.

Cobb, W., & Quinn, R. P. What workers want: Factor analyses of importance ratings of job facets. Ann Arbor, Mich.: Survey Research Center, 1971. (mimeo).

Evans, C. E. & Laseau, L. N. My job contest. Personnel Psychology Monograph, 1950, No. 1.

Hersey, R. B. Psychology of workers. Personnel Journal, 1936, 14, 291-296.

Herzberg, F., Mausner, B., Peterson, R. O., & Capwell, D. F. Job attitudes: Review of research and opinion. Pittsburg: Psychological Service of Pittsburgh: Psychological Service of Pittsburgh, 1957.

Herzberg, F., Mausner, B., & Snyderman, B. B. The motivation to work. New York: Wiley, 1959.

Jackson, J. M. The effect of changing the leadership of small work groups. Human Relations, 1953, 6, 25-44.

Jurgensen, C. E. What job applicants look for in a company. Personnel Psychology, 1948, 1, 433-445.

Kahn, R. L. & Katz, D. Leadership practices in relation to productivity and morale. In D. Cartwright & A. Zander (Eds.), Group dynamics (2nd ed.). Evanston, Illinois: Row, Peterson, & Co., 1960. Ch. 29.

Lawler, E. E., & Porter, L. W. Perceptions regarding management compensation. Industrial Relations, 1963, 3, 41-49.

Marriott, R., & Deverley, R. A. A method of interviewing used in studies of workers' attitudes. II. Validity of the method and discussion of the results. Occupational Psychology, 1955, 29, 69-81.

Morgan, J. N., Baker, E., & Sonquist, J. A. Searching for structure. Ann Arbor, Mich.: Institute for Social Research, 1971.

Morse, N. C., & Reimer, E. The experimental change of a major organizational variable. Journal of Abnormal and Social Psychology, 1956, 52, 120-129.

Morse, N. C. Satisfactions in the white-collar job. Ann Arbor, Mich.: University of Michigan Survey Research Center, 1953.

Purcell, T. V. Blue collar man. Cambridge: Harvard University Press, 1960.

Quinn, R. P. What workers want: General descriptive statistics and demographic correlates. Ann Arbor, Mich.: Survey Research Center, 1971. (mimeo).

Quinn, R. P., Seashore, S., Kahn, R. L., Mangione, T., Campbell, D., Staines, G., & McCullough, M. Survey of Working Conditions. Document number 2916-0001. Washington, D. C.: U. S. Government Printing Office, 1971.

Raube, S. A. Factors affecting employee morale. New York: National Industrial Conference Board, 1947, Studies in Personnel Policy, No. 85.

Schwartz, M. M., Jenusatis, E., & Stark, H. Motivational factors among supervisors in the utility industry. Personnel Psychology, 1963, 16, 45-53.

Sirota, D. Some effects of promotional frustration on employees' understanding of, and attitudes toward, management. Sociometry, 1959, 22, 273-278.

Smith, P. C., & Kendall, L. M. Cornell studies of job satisfaction: VI. Implications for the future. Cornell University, 1963. (mimeo).

Smith, P. C., Kendall, L. M., & Hulin, C. L. The measurement of satisfaction in work and retirement: A strategy for the study of attitudes. Chicago: Rand McNally, 1969.

Sonquist, J. A. Finding variables that work. Public Opinion Quarterly, 1969, 33, 83-95.

Sonquist, J. A. Multivariate model building: The validation of a search strategy. Ann Arbor, Mich.: Institute for Social Research, 1970.

Sonquist, J. A., & Morgan, J. N. The detection of interaction effects. Ann Arbor, Mich.: Institute for Social Research, 1964.

Walker, C. F., & Guest, R. H. The man on the assembly line. Cambridge: Harvard University Press, 1957.

Walker, J., & Marriott, R. A study of some attitudes to factory work. Occupational Psychology, 1951, 25, 181-191.

Whyte, W. F. Money and motivation. New York: Harper, 1955.

Wyatt, S., Langdon, J. N., & Stock, F. G. L. Fatigue and boredom in repetitive work. Great Britian: Industrial Health Board, 1938, Report #77.